

**Amendments to the Specification:**

Please replace the specification with the following substitute specification,  
and a clean version of the substitute specification is submitted also:

**BACKGROUND OF THE INVENTION**

Field of the Invention

This invention relates to an in-line chromatic harp,  
and more particularly to an in-line chromatic harp with  
an adjustable string position guide which allows a harp  
player to quickly identify the proper string for each  
note and to play any chromatic scale as if playing the  
C major scale.

Description of the Related Art

An in-line chromatic harp is a string instrument which has the entire twelve semitones in an octave, like the piano, and therefore versatile in music performance. Its strings, like most harps, are arranged in one line. Since in each octave of the in-line chromatic harp has twelve strings instead of seven in a conventional harp, the string spacing is narrower so that each octave will not become too wide for the hands of the harp player. There are chromatic harps designed with two rows of strings, either parallel or cross each other to preserve the string spacing of conventional harp. These harps had their position in the history and have been around for centuries.

~~This invention relates to an in-line chromatic harp with a string guide which allows the player to quickly identify the proper string position. This string guide is also adjustable to allow the player to play music in any key on the chromatic scale as if playing in "C". In fact, if one can sing in Do, Re, Mi, Fa, Sol, La, Ti, Do, he can play this harp. This makes learning how to play this harp a lot easier than piano or organ, especially if the music is composed in a key other than "C" with many sharps or flats.~~

The advantage of an in-line chromatic harp is that every one of the twelve semitones in each octave are accessible from the finger tips without any additional mechanical movement such as pushing a foot pedal or moving a lever, which is the standard practice for harp playing. For example, the concert harp requires the player to push one of several pedals in order to play a # or b (sharp or flat) note. For lever harp, the player has to flip a lever to achieve the same result. ~~This requires skill and planning~~ These require skills and training. It also limits the music one can play and often the music may need to be ~~rearranged~~ re-composed to suit the instrument.

The in-line chromatic harp is, however, not without problems or difficulties, either. The most ~~difficult~~ serious problem is that for the in-line chromatic harp the ~~string~~ spacing between any two strings ~~[[are]]~~ is

generally narrower than the conventional harp. ~~and the~~  
The standard color codes, red for "C" string and blue  
for "F" string, ~~color code is~~ are no longer adequate for  
the purpose of indicating the string position because  
there are too many strings in between. The regular harp  
has only two white strings between the red string and  
blue string, and three white strings between blue string  
and red string; therefore, there is no difficulty in  
identifying the location of any note or string. On the  
other hand, the in-line chromatic harp, if using the same  
color code to identify the "C" and the "F" strings, there  
will be four narrowly spaced white strings between the  
"C" and the "F" strings, and six narrowly spaced white  
strings between the "F" and the "C" strings. This  
arrangement becomes rather difficult to play because of  
the ~~multiple numbers~~ excessive number of the closely  
spaced strings.

~~One inventor proposed in patent #~~ US Patent No.  
2,137,160 ~~that~~ discloses a guide to be ~~set~~ disposed just  
behind the string with the same white and black key  
arrangement like the piano key so that anyone skilled  
in ~~[[the]]~~ playing piano or organ can readily acquire  
proficiency in playing ~~[[that]]~~ a harp with the guide.

~~This invention goes one step further so that even anyone not skilled in the piano or organ can acquire proficiency in playing my in-line chromatic harp with the adjustable string position guide.~~

### BRIEF SUMMARY OF THE INVENTION

It is therefore an object of the invention to provide an in-line chromatic harp with an adjustable string position guide, wherein the adjustable string position guide is rotatable.

To achieve the above-mentioned object, the invention provides an in-line chromatic harp including a body, a plurality of strings and an adjustable string position guide. The body is formed of a pillar, a neck and a sound box. The strings run from the neck to the sound box. The adjustable string position guide is movably installed behind the strings, with one end fixed to the pillar and the other end to the neck. A plurality of color dots is disposed on the surface of the string position guide and arranged in a specific pattern.

The advantages of this invention will hereinafter become more readily apparent from the following specification ~~of which the drawing forms a part, and wherein:~~ and the enclosed drawings.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a full side view of the invention.

FIG. 2 is a cross-sectional view of the section 2-2.

FIG. 3 is a perspective view of the structure of the string position guide of the invention.

FIG. 4 is a drawing of the color dot patterns on the string position guide of the invention.

### DETAILED DESCRIPTION OF THE INVENTION

Figure 1 is a full side view of the invention, where the pillar 11, neck 12, sound box 13, and the strings 9 and bridge pin 18 are typical of a Celtic folk harp. The adjustable string position guide 14[[[,]] is shown installed a small distance C behind the strings as shown on figure 2, so the ~~present of this~~ string position guide 14 will not interfere with the vibration of the strings 9. The ~~adjustable~~ string position guide 14 is mounted on the harp at an angle A to the strings 9 as shown in figure 1. ~~This position~~ The string position guide 14 is positioned right above the proper finger position for

playing the harp so the string position is easily identified with this arrangement.

Figure 2 is a cross-sectional view of section 2-2. Only the cross section of the adjustable string position guide 14 is shown here at a small distance C behind the strings 9. The ~~adjustable~~ string position guide 14 depicted here is a square bar or a four sided bar. The bar can also be a ~~triangle~~ triangular or ~~hexagon~~ hexagonal prism, and the same principle applies. For the sake of simplicity, from now on a square bar will be used in this specification except where further clarification is necessary.

Figure 3 shows a perspective view of the adjustable string position guide 14 with the pivot/slide ~~pin~~ pins 15a and 15b which are fastened on the ~~harp~~ pillar 11 and the neck 12 as shown on figure 1, and ~~[[the]]~~ with corresponding pivot/sliding ~~[[hole]]~~ holes 16a and 16b which are drilled into ~~the ends~~ each end of the ~~adjustable~~ string position guide 14. On each side of the ~~bar~~ string position guide 14 there are multiple dots of different ~~color~~ colors ~~spaced at~~ forming a special pattern which will be described later. Since the string position guide 14 is not perpendicular to the ~~string~~ strings 9, ~~[[the]]~~

a string spacing L on the string position guide 14 is equal to ~~[[the]]~~ a true string spacing S, as shown on figure 1, ~~multiplied~~ divided by ~~the inverse~~ sine of the angle A ~~[[ ]]~~, ~~[[which]]~~ defined by the ~~string~~ strings 9 and the string position guide 14 as shown on figure 1. Since the string spacing L on this harp is constant throughout the whole range, ~~[[this]]~~ which is different from most harps, and therefore the string position guide 14 can ~~slide up and down~~ in a axial direction, as shown by an arrow 17, without mismatching the color ~~dots~~ dot position to the ~~string~~ strings 9 as we will see later the significance of this feature.

The detailed layout of the color dot patterns ~~layout details of~~ on the square bar ~~[[are]]~~ is shown on figure 4. The color dot patterns for the four sides 14a, 14b, 14c and 14d of the square bar are being put side by side to show the inter relationship of the dot patterns.

On the first side 14a of the square bar ~~[[14a]]~~, the color dots are arranged in the following way:

First dot is red and is located at distance L from the left end. The second dot is white and is located at distance 2L from the first dot. The third dot is also white and located at distance 2L from the second dot.

The fourth dot is blue and located at distance  $L$  from the third dot. The distance between fourth and fifth is  $2L$ , fifth and sixth is  $2L$ , and sixth and seventh is  $2L$ . The distance between seventh and eighth is  $L$ . The spacing repeats itself for the rest of the surface[[]] , in this case, for three times. However, this should not be the limit and it depends on how many octaves the harp has. As it is shown on figure 4, the first red dot represents the position for Do, the second dot for Re, the third dot for Mi, the fourth dot, a blue dot for Fa, the fifth dot for Sol, the sixth dot for La, and the seventh dot for Ti, and the eighth dot, a red dot again, back to Do of one octave higher. This color code arrangement is the same as a standard harp string color code, that is two white strings between red and blue string and three white strings between blue and red string and this makes the learning transition from a standard harp to this new in-line chromatic harp fairly easy.

The side 14a is the first side of four sides which can be used for string position guide. The second side 14b, the third side 14c, and the fourth side 14d can be switched into position by turning the square bar on its



pivots 15a and 15b within the holes 16a and 16b as the arrows indicated in figure 2.

On the second side 14b, the dot spacing pattern is the same as 14a except the first red dot is shifted a distance of 3L to the right as shown in figure 4. On the third side 14c, the first red dot is shifted a distance of 6L to the right as shown in figure 4. On the fourth side 14d, the first red dot is shifted a distance of 9L to the right as shown in figure 4. [[(]]If the string position guide 14 is a triangular bar the red dot lateral shift will be 4L from one side to the next side. If the string position guide 14 is a ~~hexagon~~ hexagonal bar the red dot lateral shift will be 2L from one side to the next side. [[[)

It becomes apparent that, by turning the string position guide 14[[[,]] 90 ~~degree~~ degrees from one side to the next side, the position of "Do" is shifted up or down three half-tones depends upon the direction of turning. [[(]]If the ~~adjustable~~ string position guide 14 is a triangular bar, the turning will be 120 degree, and if the string position guide 14 is a ~~hexagon~~ hexagonal bar, the turning will be 60 ~~degree~~ degrees.[[[]]]

The string position guide 14 ~~itself~~ is held by two pivot pins 15a and 15b inside the holes 16a and 16b. The holes are deep enough so that the string position guide 14 can slide axially up and down by at least three L as shown by the arrow 17 on figures 1 and 3. This allows the first red dot or "Do" to be set at any of the three positions at each side of the string position guide 14.  
[[()]]If the guide 14 is a triangular bar, the axial movement will need to be at least four L, if the guide 14 is a hexagon bar, the movement will need to be at least 2L. [[()]]

The result of this arrangement will allow "Do" on this string position guide to be placed at any one of the twelve possible positions of the chromatic music scale required by music.

Since the ~~pattern~~ patterns of the dot arrangement on all four sides are the same, except [[it]] that the dots for each pattern [[is]] are being shifted right or left, the finger position, once learned by the player, would be the same no matter in what "key" the music is written. This is a tremendous simplification in playing music. In fact, this makes playing this in-line chromatic harp a lot easier than learning how to play piano, especially for music composed in a "~~key~~" scale, other than "C Major",

with many sharps or flats. This is an instrument for  
[[the]] an amateur to play like a professional without  
a long and tedious learning process.

The color dot ~~pattern~~ patterns on the ~~adjustable~~  
string position guide 14 can be made in black and white,  
~~just like the piano keyboard as it was described in patent~~  
# US Patent No. 2,137,160, and ~~shift~~ shifted three  
half-tone from one side to the next side. ~~and achieve~~  
~~the similar result mentioned in the previous paragraph~~  
~~for one who are skilled in piano or organ to simplify~~  
Further, anyone can play the harp of the present  
invention with [[the]] music playing simplified and  
avoid without the complication complicated usage of  
using the black keys unnecessarily when the music is not  
written in "C major".

A special color mark (red is preferred in this case)  
is placed on the bridge pin 18, as depicted on figure  
1, of the middle C string to identify the starting  
reference point of the ~~adjustable~~ string position guide  
14. This position designates the location of the central  
note for the "C Major" scale.

The beauty of this invention is that there is no mechanical motion to change the string length to achieve semi-tones like either the pedal harp or the lever harp. To slide the guide up or down a fraction of an inch, or to turn the guide around its pivot is very simple without even touching the string and yet the chromatic music scale is transposed up and down at the player's wish with minimal effort.

While the invention has been described by way of examples and in terms of preferred embodiments, it is to be understood that the invention is not limited to the disclosed embodiments. To the contrary, it is intended to cover various modifications.  
Therefore, the scope of the appended claims should be accorded the broadest interpretation so as to encompass all such modifications.